

Potlatch

**Potlatch Corporation
Resource Management Group
Idaho Region**

St. Joe Area Woodlands
P.O. Box 386
St. Maries, Idaho 83861-0386
Telephone (208) 245-4146
Fax (208) 245-6421

August 15, 2000

**State of Idaho
Division of Environmental Quality
2110 Ironwood Parkway
Coeur d' Alene, ID 83814-2648**

Attention: Kreg Beck

RE: Corrective Action Plan – Avery Landing Site

Dear Kreg:

In accordance with our Consent Order Modification dated April 20, 2000, Potlatch Corporation submits our Corrective Action Plan for the Avery Landing Site. The Corrective Action Plan was prepared by our Environmental Engineering Consultant, Hart Crowser, Inc., and it is attached for your review and approval.

Your prompt review of our Corrective Action Plan would be appreciated. Our scheduled construction startup date is September 11, 2000.

Kreg, if you have any questions feel free to call me at my St. Maries office.

Sincerely,



**Norm Linton
Area Manager**

**NL:sh
Attachment**

**cc: John Emery
: Greg Rapp
: Larry Bentcik
: Greg Rayner – Corps of Engineers
: Greg Weigel – U.S., EPA, Boise
: Rick Donaldson – U.S.F.W.S., Spokane
: Chip Corsi – IDFG, Coeur d' Alene
: Ken Knoblock – ID Dept. of Water Resources**



HARTCROWSER

Delivering smarter solutions

www.hartcrowser.com

August 7, 2000

Anchorage

Mr. Norm Linton
Area Manager
Potlatch Corporation
1100 Railroad Avenue
P.O. Box 386
St. Maries, Idaho 83861

Boston

Chicago

Re: Corrective Action Plan
Avery Landing Site
Avery, Idaho
J-2296-07

Denver

Dear Mr. Linton:

This report presents the Corrective Action Plan for Avery Landing Site in Avery, Idaho. The goal for this action is to stop migration of oil into the St. Joe River. The remedial method to ensure this goal is to excavate the existing shoreline and place an impermeable barrier upgradient of the river to block subsurface migration of free phase hydrocarbons (see Figure 1). Clean cover material would be placed over the impermeable barrier to restore the appearance and function of the shoreline. Figure 5 shows a generalized cross section of the repaired bank. The bottom elevation of the impermeable barrier will be sufficient to prevent migration of free phase hydrocarbons to the river, but not significantly impact the flow of groundwater.

Fairbanks

Jersey City

Juneau

Complete removal of free product in shoreline soil will require excavation below the normal low water elevation of the St. Joe River. A temporary cofferdam (see Figure 2) using retainer blocks will be constructed to keep the St. Joe River from running through the construction area.

Long Beach

To improve fish habitat during the shoreline restoration, four barbs will be constructed as shown on Figure 6. Additionally, the riparian zone above the riprap shoreline will be planted (see Figure 7).

Portland

The following sections describe the work to be completed in detail.

Seattle



SILT CONTROL AND CONTINGENCY SPILL PLAN

During construction of the remedial action, release of silt and petroleum hydrocarbons to the environment will be controlled using retainer blocks, oil absorbent booms, an oil/water separator, and silt fences installed along a drainage ditch.

A retainer block cofferdam will be used to prevent the flow of water from the St. Joe River into the construction area (see Figure 1). Sandbags will be used to seal the retainer block wall and prevent the flow of water between adjacent blocks (see Figure 2). A dewatering pump will be used to remove water from the excavation area during construction. The water removed from the construction area behind the cofferdam will be run through an oil/water separator tank (Figure 3) and then released into a rock ditch with multiple silt fences. The effluent water will then drain back into the St. Joe River. Figure 1 depicts the general site layout and existing rock ditch. The oil/water separator (see Figure 3) will also act as a settling tank to help reduce turbidity in the water. Water quality of the discharge will be monitored visually. If the discharge becomes cloudy or obviously impacted with silt, the construction will be stopped until additional controls are installed and working.

An oil absorbent boom will be placed in the St. Joe River, outside of the retainer block cofferdam, to absorb and contain petroleum hydrocarbons in the event of a release to the river. This is the same procedure currently used at the site to control releases of petroleum products to the river. Additional oil absorbent booms will be available on site in the event of catastrophic failure of the retainer block cofferdam. In the event the cofferdam has to be unattended for more than one day, absorbent booms will be installed inside of the cofferdam to collect any material released from the shoreline.

WALL CONSTRUCTION

Construction of the containment wall will require excavation of about 10 feet horizontally of the existing river bank. Five collection wells will be installed along the wall to remove free product that becomes trapped behind the containment wall. Figure 4 depicts the layout of the containment wall and collection wells. A liner will be placed along the cut-off wall to prevent migration of the free phase petroleum product but allow groundwater to flow beneath the wall to the St. Joe River. Riprap will be placed on the river-side of the cut-off wall to hold the liner in place, and provide suitable fish habitat.



Removal Activities

The existing shoreline will be excavated to provide a stable slope from the top of the bank to 2 feet below the low water mark. In addition, five areas will be excavated into the slope to accommodate 2- to 3-foot-diameter 15-foot-long vertical collection wells. Native vegetation and existing soil will be retained to the extent possible for use in replanting the remediation area. Soil stained by contact with petroleum hydrocarbons will be stockpiled in an upland area of the site. The soils will be spread out in a thin layer to maximize natural attenuation of the contamination.

The construction water behind the cofferdam will be pumped to the oil/water separator to allow for the installation of the liner. Sheens on construction water will be removed using absorbent booms and pads. Every effort will be made to ensure no residual oil is left on the river side of the containment wall.

Liner Installation

A 30-mil oil-resistant PVC alloy liner (Arctic Liner), or equivalent, will be used to prevent migration of petroleum hydrocarbons in the subsurface. The liner will be installed between two layers of 12-ounce non-woven geosynthetic fabric, or equivalent, to prevent puncturing the membrane during installation. A 6-inch bedding layer and a 6-inch cover layer will provide a uniform surface for placing the liner and cover materials. An 18-inch thick layer of crushed rock or clean fill will be placed over the cover layer as a base for the riprap layer. The placement of these materials is depicted on Figure 5.

Riprap Installation

Large, two-man rocks (200 to 500 pounds each) will be placed along the cut-off wall, trailing into the river. The riprap will protect the cut-off wall from erosion and provide aquatic habitat. Once the riprap is installed, the retainer block cofferdam will be removed to restore normal stream flow in the St. Joe River.

Riprap barbs will be installed as shown on Figure 6 to break up the shoreline current and provide additional aquatic habitat. An excavator will place the riprap directly on the riverbed, disturbing the river bottom as little as possible.



Potlatch Corporation
August 7, 2000

J-2296-07
Page 4

RIPARIAN ZONE INSTALLATION

The riparian zone installed above the cut-off wall will be planted with native vegetation to promote a natural appearance for the site. Native shrubs retained during the shoreline excavation will be placed along an 8- to 10-foot-wide strip of flat ground above the riprap wall (see Figure 7). Cottonwood and willow trees will be planted along the wall to provide shade to the river habitat.

LONG-TERM SITE MONITORING

Monitoring in collection wells 1 and 5 (CW-1 and CW-5) will be required to ensure the free product captured by the wall does not build up to a thickness that could migrate around the end of the wall. Assuming a 10-foot smear zone CW-1 and CW-5 would require about 320 gallons of free product oil to fully saturate the 80 feet of soil between the collection well and the end of the wall. Based on a 3-foot-diameter collection well, the total thickness of free product allowed to collect in the well should not exceed 6 feet. Allowing for a long-term build-up of saturated soils and a safety factor of 6, the product in the well should be removed from the collection well whenever it exceeds 1 foot. If a 2-foot-diameter collection well is used, product should still be removed when the thickness exceeds 1 foot to limit the product gradient toward the end of the wall.

LIMITATIONS

Work for this project was performed, and this letter report prepared, in accordance with generally accepted professional practices for the nature and conditions of the work completed in the same or similar localities, at the time the work was performed. It is intended for the exclusive use of Potlatch Corporation for specific application to the referenced property. This report is not meant to represent a legal opinion. No other warranty, express or implied, is made.



Potlatch Corporation
August 7, 2000

J-2296-07
Page 5

Any questions regarding our work and this letter report, the presentation of the information, and the interpretation of the data are welcome and should be referred to the undersigned.

We trust that this report meets your needs.

Sincerely,

HART CROWSER, INC.

TERRY W. MONTOYA
Project Manager

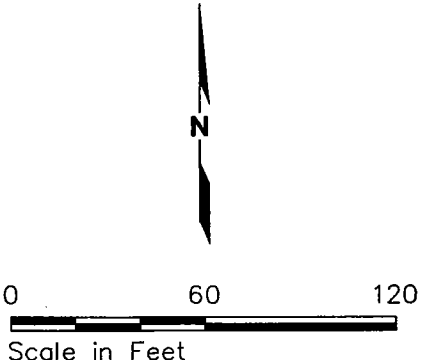
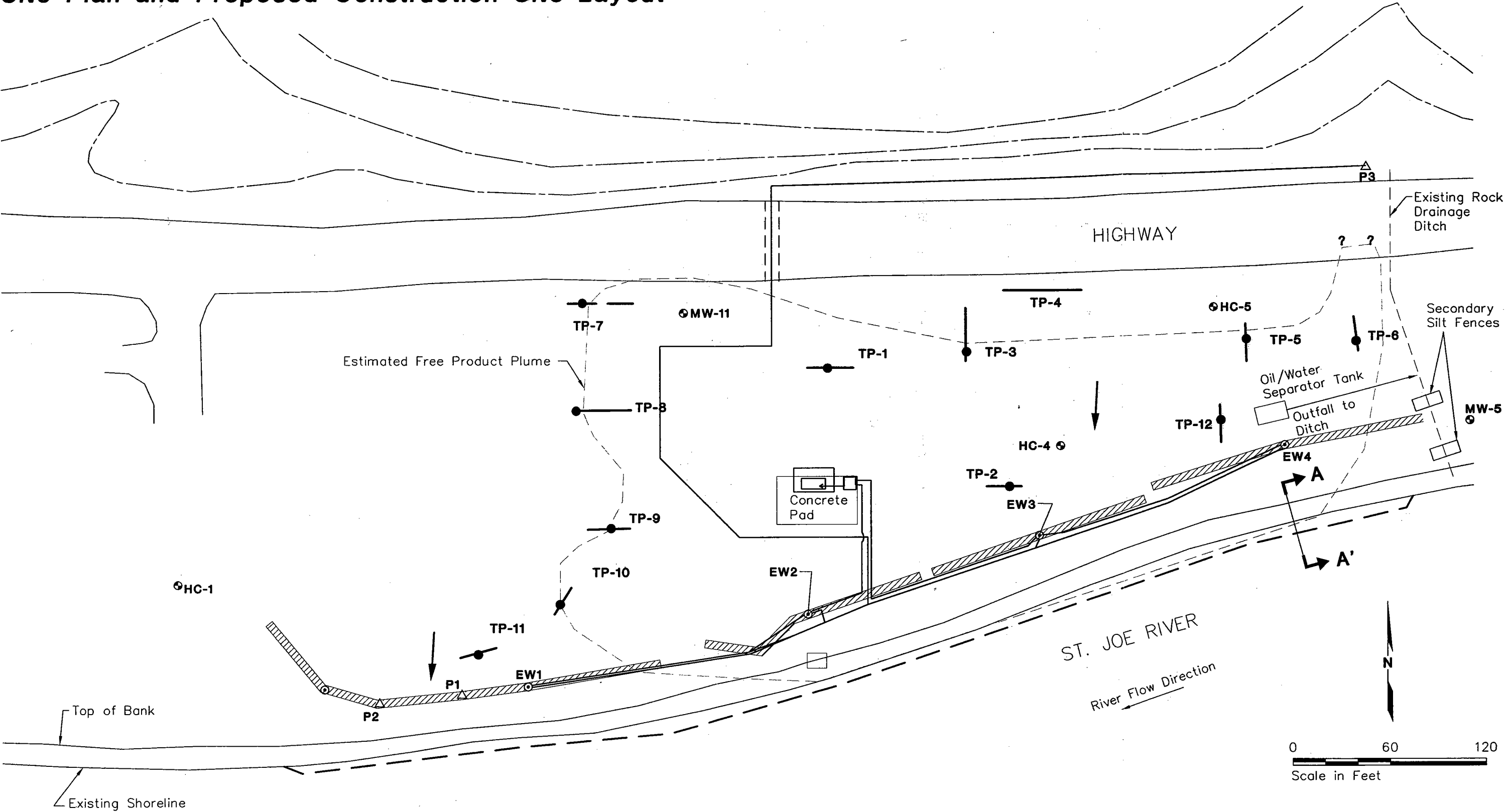
MATTHEW F. SCHULTZ, P.E.
Sr. Associate Chemical Engineer

F:\Docs\Jobs\229607\CorrectAction(ltr).doc

Attachments:

- Figure 1 - Site Plan and Proposed Construction Site Layout
- Figure 2 - Retainer Block Cofferdam Detail
- Figure 3 - Oil/Water Separator Detail
- Figure 4 - Proposed Containment Wall Location
- Figure 5 - Containment Wall Detail
- Figure 6 - Barb Detail
- Figure 7 - Riparian Zone and Riprap Wall Area

Site Plan and Proposed Construction Site Layout



Exploration Location and Number

- MW-4 Monitoring Well
- EW1 Extraction Well
- △ P1 Piezometer

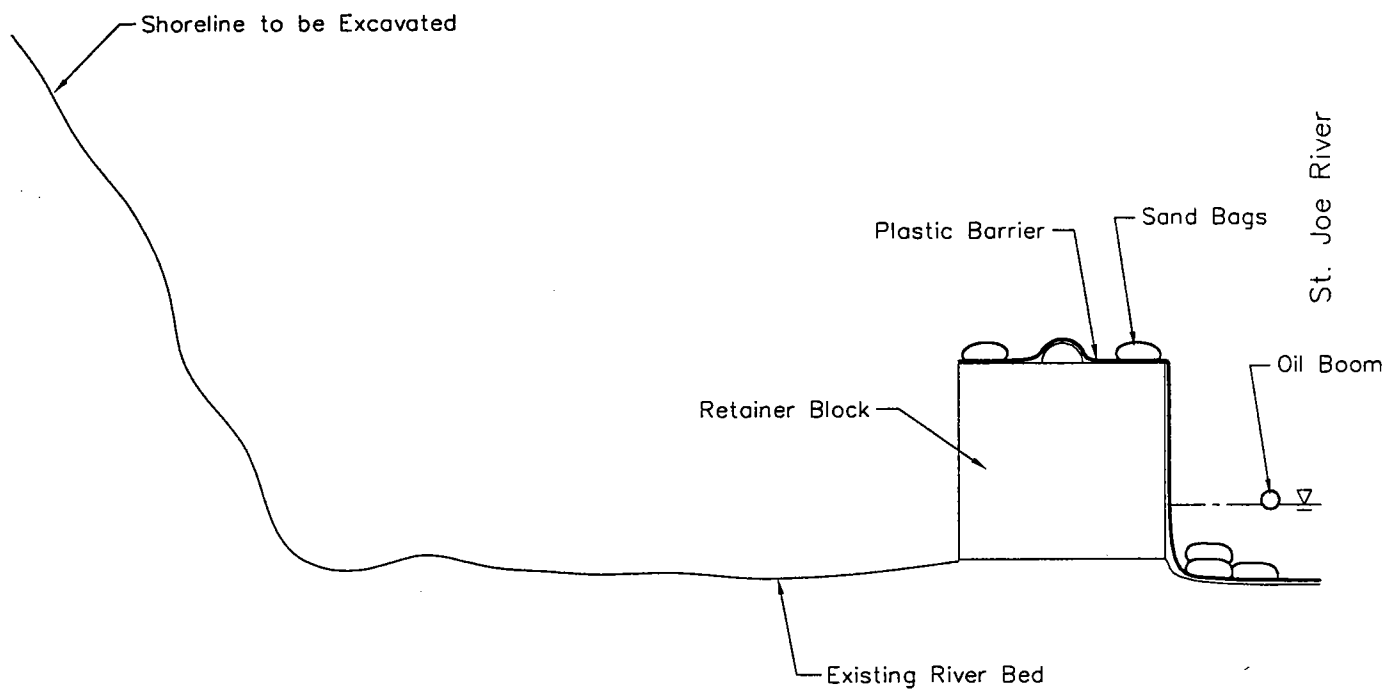
- ← Approximate Groundwater Flow Direction
- Existing Extraction Trench
- Free Product Plume Area
- Retainer Block/Sand Bag Cofferdam

- TP-1 Test Pit Location and Number
- TP-1 Test Pit Monitoring Well Location and Number
- ↻ A A' Cross Section Location and Designation (See Figure 2)

DTN 7/26/00 1=60 charlie.pc2 22960712

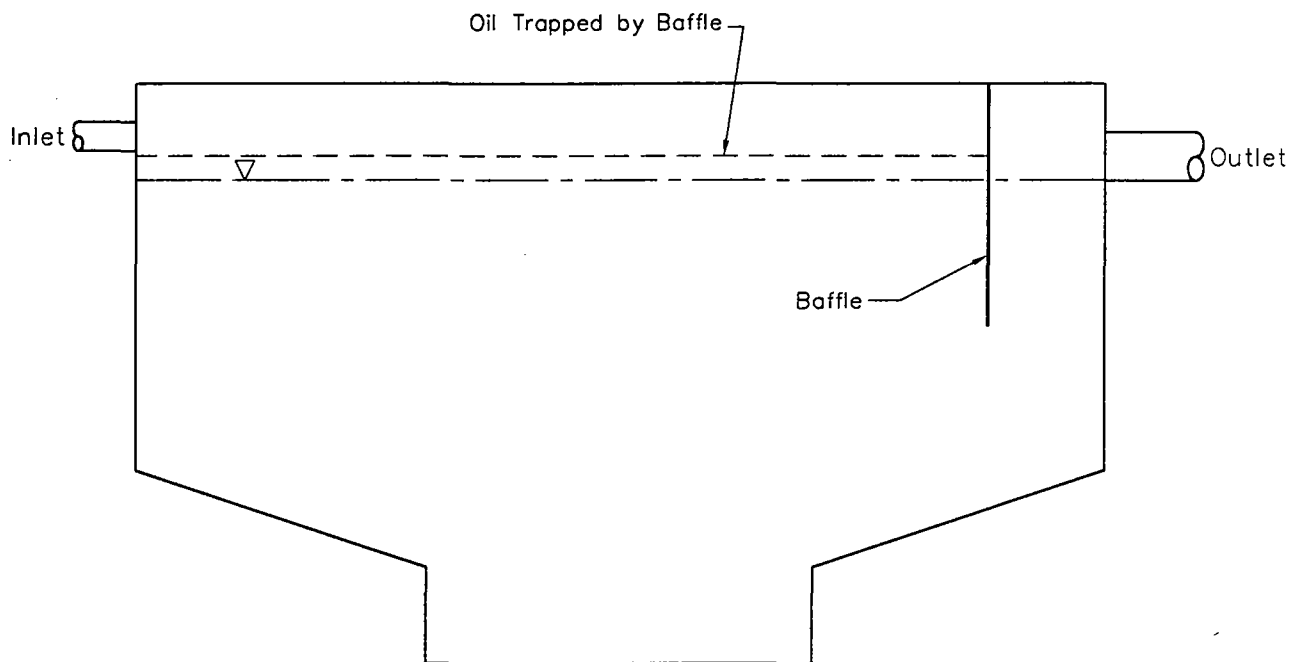
Retainer Block Cofferdam Detail

Cross Section A-A'

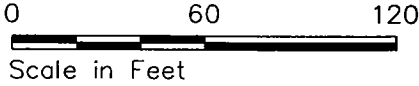
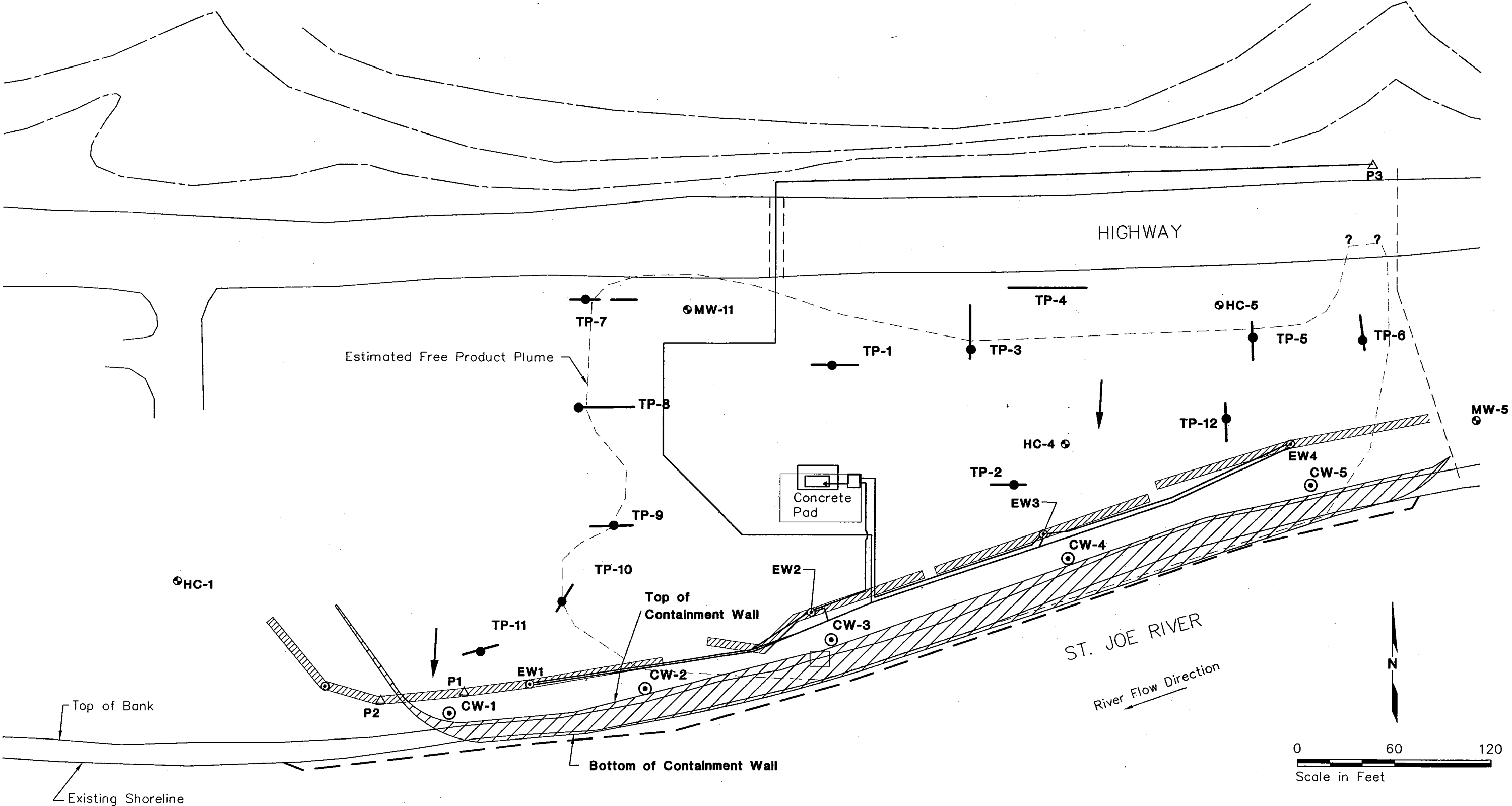


Not to Scale

Oil/Water Separator Detail



Proposed Containment Wall Location



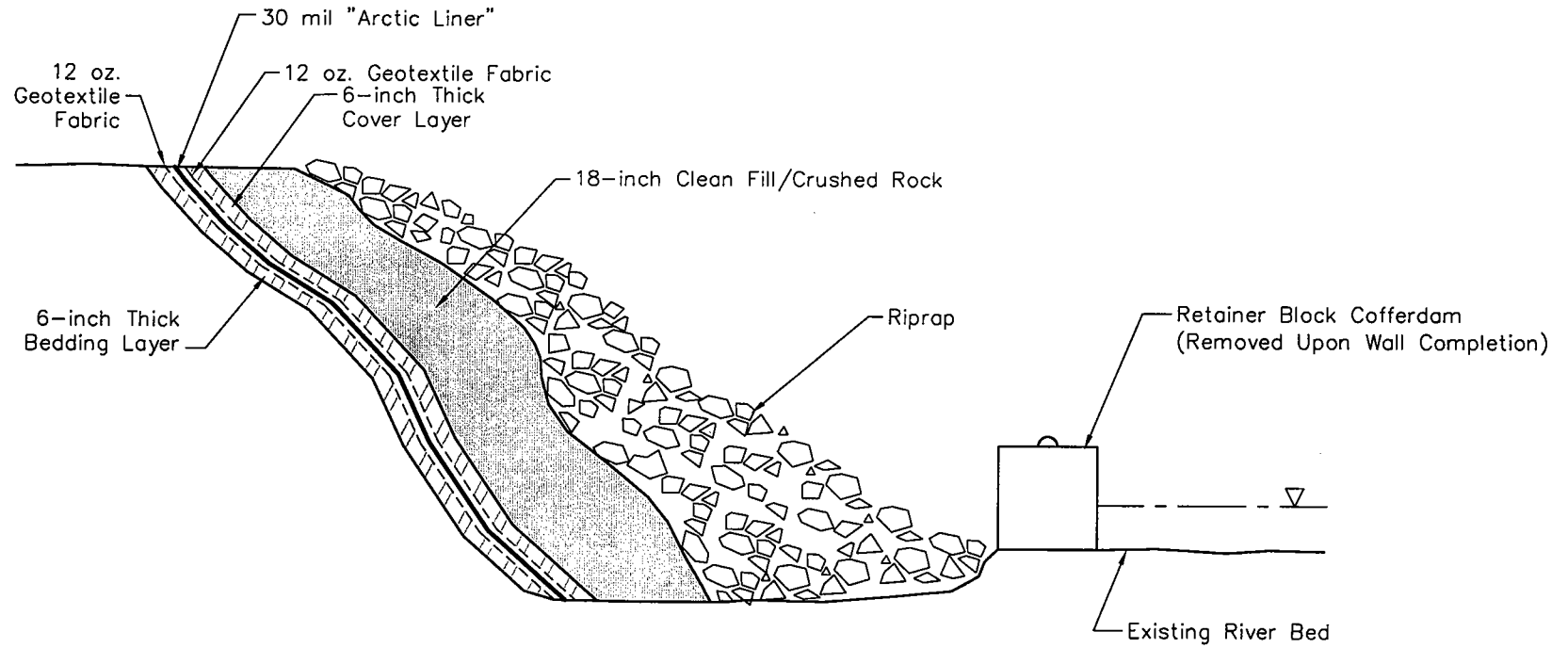
Exploration Location and Number

- MW-4 Monitoring Well
- EW1 Extraction Well
- △ P1 Piezometer

- ← Approximate Groundwater Flow Direction
- ▨ Existing Extraction Trench
- - - Free Product Plume Area
- - - Retainer Block/Sand Bag Cofferdam

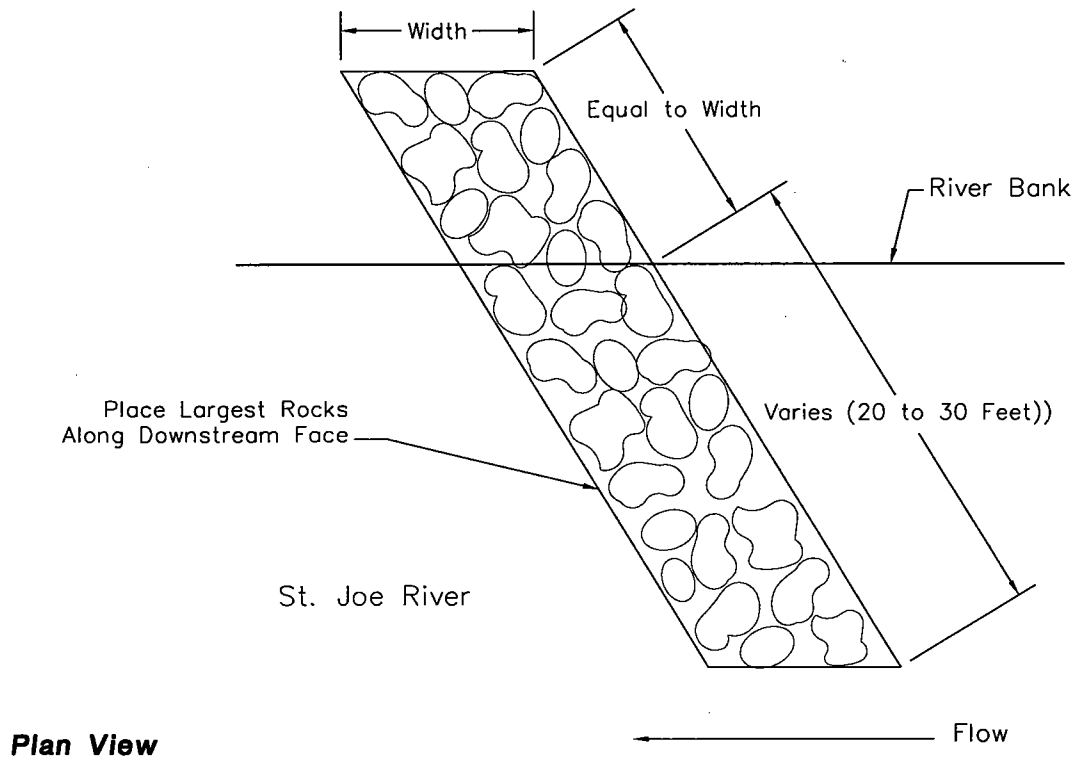
- TP-1 Test Pit Location and Number
- TP-1 Test Pit Monitoring Well Location and Number
- CW-1 Collection Well Location and Number
- ▨ Proposed Containment Wall

Containment Wall Detail

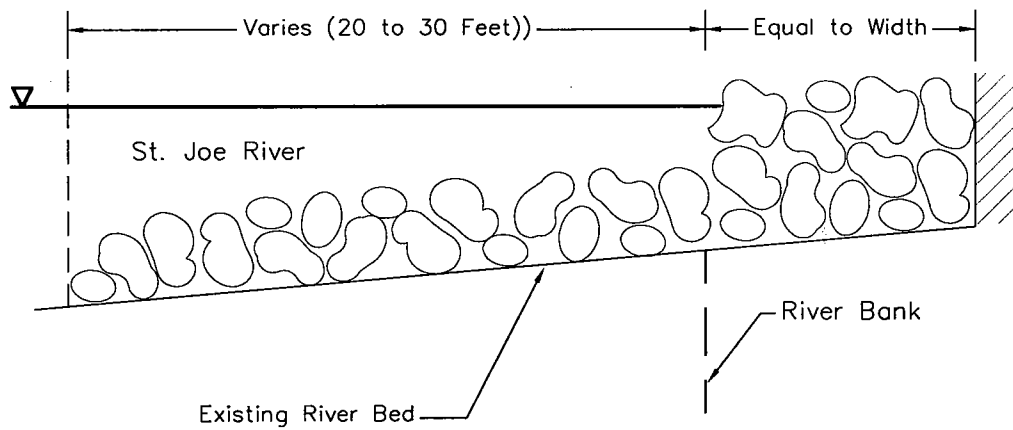


Not to Scale

Barb Detail

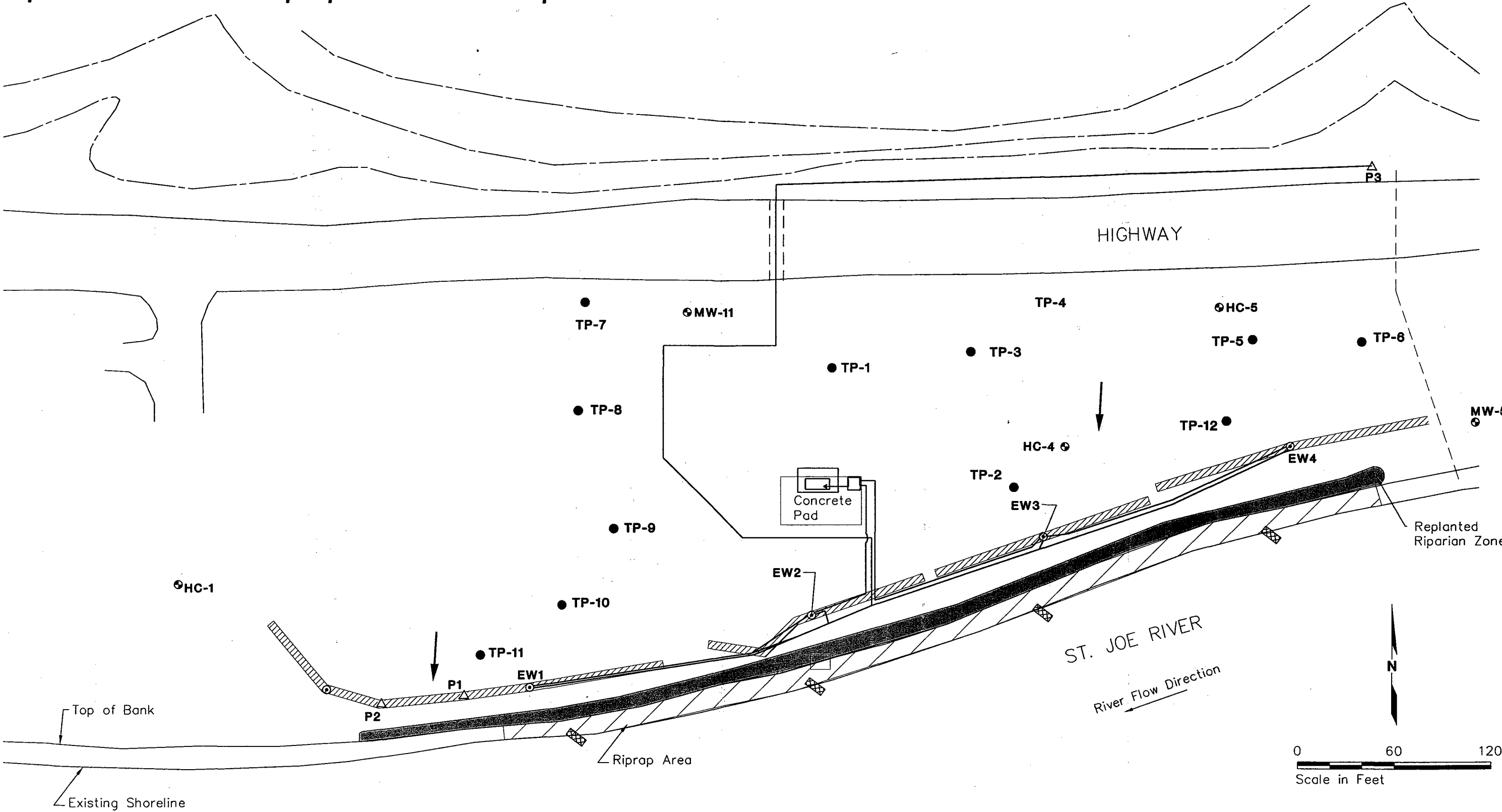


Plan View



Cross Section

Riparian Zone and Riprap Wall Area Map



Exploration Location and Number

- MW-4 Monitoring Well
- EW1 Extraction Well
- △ P1 Piezometer



Approximate Groundwater Flow Direction



Existing Extraction Trench



Area of Riparian Zone to be Replanted

- TP-1 Test Pit/Monitoring Well Location and Number
- ▨ Riprap Barb Location



HARTCROWSER

J-2296-07 7/00

Figure 7

D:\1 8/18/00 1=60 charlie.pcx
22960714

Anchorage
2550 Denali Street, Suite 705
Anchorage, Alaska 99503-2737
Fax 907-276-2104
Tel 907-276-7475

Boston
100 Edmings Center, Suite 331G
Beverly, Massachusetts 01915-6123
Fax 978-921-8164
Tel 978-921-8163

Chicago
626 North Western Avenue
Lake Forest, Illinois 60045-1921
Fax 847-295-8033
Tel 847-295-0077

Denver
274 Union Boulevard, Suite 200
Lakewood, Colorado 80228-1835
Fax 303-987-8907
Tel 303-986-6950

Eureka
317 Fortuna Boulevard
Fortuna, California 95540
Fax 707-726-9146
Tel 707-726-9145

Fairbanks
1896 Marika Street, Unit 1
Fairbanks, Alaska 99709-5545
Fax 907-451-6056
Tel 907-451-4496

Jersey City
75 Montgomery Street, Fifth Floor
Jersey City, New Jersey 07302-3726
Fax 201-985-8182
Tel 201-985-8100

Juneau
319 Seward Street, Suite 1
Juneau, Alaska 99801-1173
Fax 907-586-1071
Tel 907-586-6534

Long Beach
One World Trade Center, Suite 2460
Long Beach, California 90831-2460
Fax 562-495-6361
Tel 562-495-6360

Portland
Five Centerpointe Drive, Suite 240
Lake Oswego, Oregon 97035-8652
Fax 503-620-6918
Tel 503-620-7284

Seattle
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Fax 206-328-5581
Tel 206-324-9530